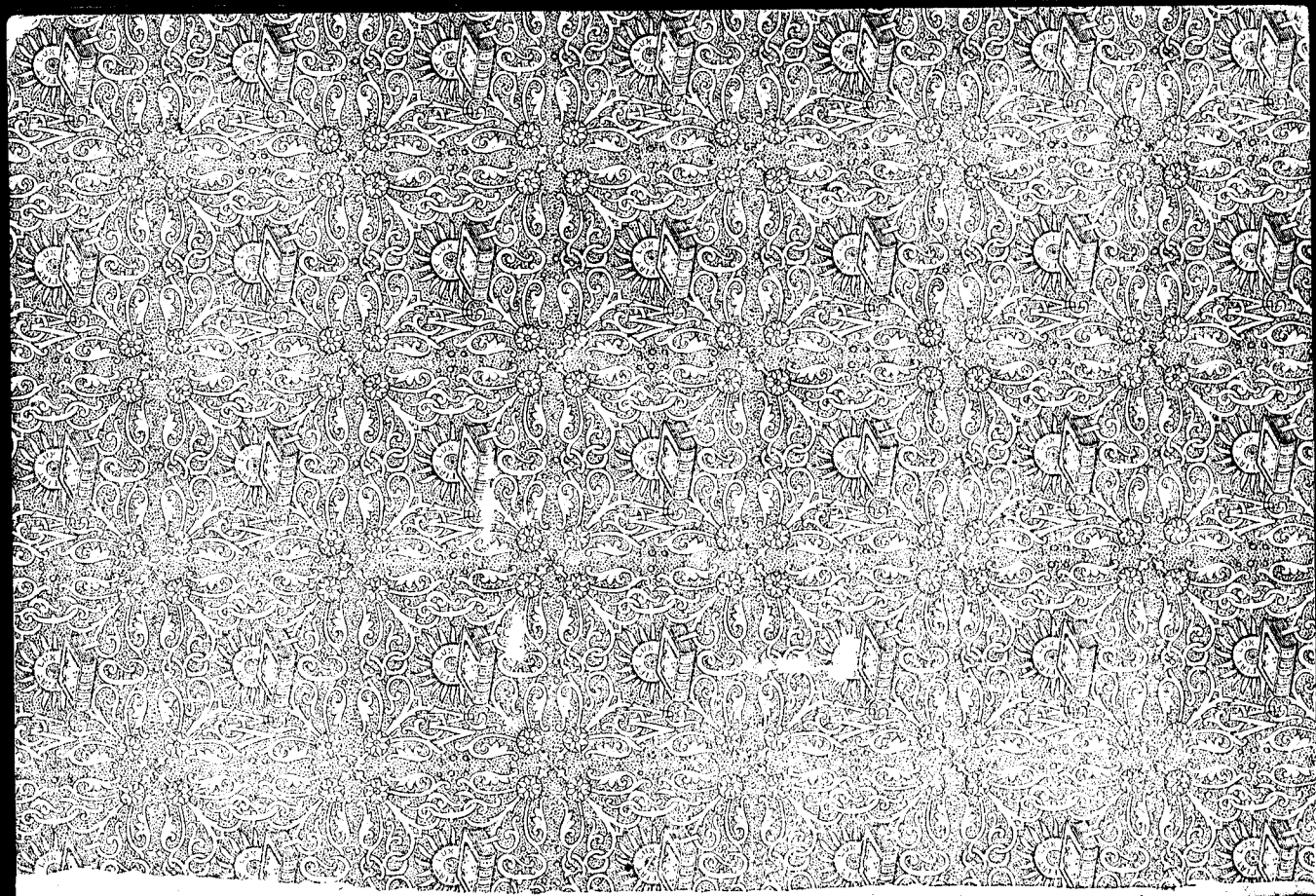

THE BICYCLE,

ITS SELECTION, RIDING AND CARE.

By L. F. KORNS.

PRICE, - - 75 Cents.

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DEDICATION.

To the Ladies' Cycling League of Minneapolis, Minn., whose manner of riding is especially commendable, and whose kindness has contributed not a little to the character of these pages, this book is respectfully dedicated with best wishes of

THE AUTHOR.

INDEX.

THE BICYCLE AND ITS BENEFITS.

RIDING a bicycle at reasonable speed on a good road is simply delightful. A speed three times that of walking is attained as easily as one rocks a rocking chair. A ride at moonlight is a nerve tonic that beats all the phosphorous compounds that Esculapius ever dreamed of.

The safety is the machine that makes these benefits and pleasures possible. Mechanically considered, the high wheel has good lines, but ninety per cent. of men were afraid to ride it. On the other hand, ninety per cent., including a large percentage of ladies, are anxious to ride the safety. It is alike adapted to business, to racing and to pleasure.

As a means of locomotion, it is the fastest of road steeds, is always ready for use, and never consumes grain. On an average country road it will outstrip the fastest blooded horse for any distance above a first few miles. A hill of medium grade is easily ascended, and once the summit is reached, comes the speed and pleasure of coasting. The feet are placed on the foot rests or coasters, and with no fear of "headers," the rider flies with increasing speed until the hill has entirely risen behind him. Every energy is awakened; every lung cell is filled with new air; the blood circulates with a lively action, and melancholy is left on the other side of the hill.

To the business man who is shut up in an office or store most of the day, it is a God-send. It gives

him the exercise he so much needs and which he would not get in any other way. He is not compelled to wait for a street car that, when it does come, is too full for comfort. He can live out where air is pure and rents are cheaper, for distance has no terrors to the bicycle rider. True, he cannot ride the entire year, but his steed costs nothing to keep while idle.

As a means of pleasure cycling stands in the foremost rank, but in common with all the great pleasures, it may easily stand among the foremost in abuse. The desire to ride at an unreasonably high speed may become morbid. A useless pride may cause one to climb steep hills where he ought to walk. The strength expended on a steep hill for no other purpose than pride may prove too much for the endurance of the rider. This is very foolish, because it is so easy to dismount, and walking up a very steep hill is quite as speedy as riding anyway. The everlasting scorcher, bent like a hoop, and with sunken cheeks, ought to be quite sufficient warning against this abuse.

Many people are now looking toward cycling as a benefit to debilitated health.

Bicycle stores are besieged by pale men and women asking if they can recuperate their health by riding. The question is being debated by the public pro and con. Some people believe it to be a positive injury. The uninitiated can hardly understand how a lady may with profit to her health ride a bicycle. Some years ago a noted physician said, "Show me a bicycle rider and I will show you a case of kidney trouble." But public opinion is fast changing. The doctors generally are advocating the use of the wheel for the majority of men and women. This change is not alone due to the general tendency of the present

age to physical as well as mental advancement, but to the change in the bicycle itself. When the above mentioned doctor poured his anathema on the "bone shaker" of his day, it richly deserved it. The bicycle of a few years ago furnished its rider with about as much comfort as a rail. The saddle was hard and had no springs, or very imperfect ones. The tires were hard and unyielding, At high speed the jar caused a nervous and physical exhaustion almost equaling an electric shock.

The bicycle of to-day is quite a different thing. The saddles are so made with leather put on a light frame, and so arranged with springs that it yields at almost every point. Some bicycles have spring frames which absorb the jar, but what is better, is the air and cushion tires, which absorb elevations and depressions, and, as a result, kill vibration at the ground, thus saving both machine and rider. These modern bicycles are to the old "bone shaker" what the palace car is to the old stage coach. An invalid who could not endure the old stage coach, might ride hundreds of miles in a palace car without injury.

A sickly or weakly person should commence the work gradually, taking but a few minutes instruction at a time. In cases where a building up of the energies is necessary, many days, or even weeks, may be needed for the work. Even after such a person has learned to ride, only the best roads should be used for some time. Stick to it, for in the end you are almost sure to derive a benefit. When you shall have become a rider, you will have an incentive to take open air exercise, which friends and physicians could not induce you to take in any other way. It can scarcely be other than a benefit. Cycling fills the remotest cells of the lungs with

outdoor air. The pores are opened and the dead secretions are thrown off. It aids the peristaltic movement of the bowels, which they have in their normal condition, and thus it becomes a panacea to that great enemy to most every condition of health —constipation.

Out-door exercise tends to the highest physical and mental advancement of the race. When Greece gave her models of learning and art to the ages, it was then that she had her national out-door games and exercises.

The position on the wheel, if properly taken, is a combination of walking, standing and sitting, which gives the most perfect relaxation. You are interested in what you are doing, and doing what you are interested in. Do not ask for a bicycle run by electricity or any motive power other than your own. The flower we love the best is the one we plant and till with our own hands.

Hundreds of instances might be given where cycling has been of the greatest possible benefit to invalids. A few cases may be named here.

In the spring of 1890 a lady visited the Snow riding school in Minneapolis. She weighed but ninety-eight pounds, and was unable to do much of anything. Physicians had failed to aid her. At first she could ride but a few minutes at a time. Her shoulders drooped so her teacher was compelled to raise them. Slowly she learned to ride, and then she began to improve. She soon weighed 118 pounds and became one of the strongest and most graceful of riders.

Another case was that of a young lady who had periodical spasms, and who had not been able to attend school for two years. Care was taken with her instruction. Her case seemed a hopeless one,

No. 1. Correct Position.

No. 2. Incorrect Position.

and it took some weeks to get her to ride. She is now attending school again and she calls the bicycle her doctor.

A gentleman who had been a bookkeeper for twenty years, presented himself. His nerves were overtaxed, and, as he sat on the wheel, he trembled like an aspen leaf. It took weeks to get him to go alone, but he is now a good road rider. Ask these parties what they would take for their wheels.

WHAT PHYSICIANS, MINISTERS AND THE PRESS HAVE TO SAY.

Homœopathic doctors are in favor of bicycle riding for women and men, provided it is done in moderation. The fact was brought out last night in the new club-room of the Palmer house during the session of the Academy of Homœpathic Physicians and Surgeons. Dr. Robert N. Tooker has long been investigating the effect of bicycle riding upon girls and young women and last night he gave his colleagues the results of his labors in a paper on "Bicycling for Girls."

The doctor first spoke of the effect of bicycling on men, and showed by numerous cases known to himself that the moderate use of the rubber-tired wheels was one of the very best means for developing a symmetrical muscular system. Repeated inquiries and investigation failed to show that the effect was at all injurious. The prejudice which seemed to exist against bicycling by girls the doctor thought not nearly so well founded as that of their riding on horseback. The latter, in his opinion, was far more dangerous.

MOTHERS FOUND NO FAULT.

During his investigations the doctor talked with more than a score of mothers whose daughters were devotees of the wheel, and none of them has become aware of any ill consequences. He never knew, himself, of a single instance where the use of the wheel injured the health of a girl or woman. On the contrary, he knows of several cases where weak girls have grown strong and robust and have recovered from chronic and peculiar ills after using a bicycle in moderation.

His individual opinion was that the use of the wheel is one of the most wholesome and exhilarating exercises that women can indulge in.

In order to test the general sentiment of the profession on the subject, the doctor interviewed a large number of leading physicians and sent letters of inquiry to many others. The unanimous testimony was in favor of the healthfulness of the bicycle and a general recommendation was volunteered that the use of the wheel for women should be encouraged by the profession at large. He firmly believes that the general use of bicycles — always in moderation, of course — by growing girls would tend to produce healthier wives and mothers and greatly enhance the future well-being of women.

BICYCLES FOR WORKING GIRLS.

He knows of no better ready field for the philanthropist han that of bringing the bicycle in reach of working-girls who are obliged to stand all day in a store and then compelled to walk home of else ride in the overcrowded street cars.

He suggests that merchants and manufacturers who employ a large number of girls and young women would benefit both themselves and employes by purchasing wheels at wholesale and selling them to their employes at cost on the installment plan. In case of girls who are slightly out of health, where the question of bicycling came up, he recommended that the matter should be submitted to an experienced physican and his judgment should be considered and acted upon.

UNANIMITY OF OPINION.

After the session had adjourned Dr. Tooker, in speaking of the subject of his paper, said he was surprised at the unanimity of opinion among homœopathic physicians regarding bicycle riding. They all believed that using the wheels in a moderate degree was greatly beneficial both to males and females.

"That does not mean wheeling a hundred miles a day," said the doctor. "That is bad, very bad. But then anything can be driven to extremes. Women should not go out bicycling in rough, wet weather, nor should they over-exert themselves."

Never until I purchased a bicycle and learned its use did I get the best return in health and pleasure. It brings into active

play a greater number of muscles than almost any other form of rational athletic sport.—*A. D. Rockwell, M. D,. in N. V, Medical Journal.*

If I had a boy and he did not take to the healthy and most delightful exercise of cycling, I should certainly feel anxious regarding his future, for, I am sure there would be something lacking in the poor boy.—*Dr. T. N, Brown, Brooklyn.*

I have reached the age of 46 years, a period of life when we begin to feel that we are not as young as we were at 20 but my wheel makes me feel like a boy again.—*A. M. Stackhouse, M. D., Allentown, Pa.*

Intelligent experience demonstrates that the proper use of cycling is doing and will do more to make our boys and girls vigorous men and women than any other exercise. It is a Godsend.—*Dr. Chas. J. Walch, Syracuse.*

Cyclers see considerable more of this beautiful world than any other class of citizens. A good bicycle well applied will cure most ills this flesh is heir to.—*Dr. W. K. Doty, New York.*

Work and recreation are not often effected at the same time. One using a bicycle in business makes an exception to the rule.—*Dr. Edgar H. Earl, Rochester.*

The well-nigh-universal use into which cycling is coming among all classes of people hardly calls for any recommendation. Its value is established.—*Dr. T. E. Murrell, Little Rock.*

Who should ride? I answer, the active for rest; the sedentary for exercise; the well to keep so; the invalid to regain health.—*Dr. Ira M. Comstock.*

I have found, as a dentist, that a Safety bicycle is the best backache cure and care destroyer; a sure exhilarator of the spirits, and cheap at any price.—*Dr. L. Van Orden, San Francisco.*

Although over sixty years of age when I took up riding the Safety, I am more in love with the pleasure than ever.—*E. R. Sisson, M. D., New Bedford.*

I fear that the universal adoption of cycling would be bad for the doctors.—*J. A. Chase. M. D., Pawtucket.*

One day, more than two years ago, the busy pastor of a large city church, ready to sink under his heavy burden, stood waiting on the corner for a street car. Suddenly a young man shot by on a bicycle, at the rate of twelve miles an hour. The practical lesson was quickly learned: "If he can speed thus for pleasure, why not I for business?" Within four days he was doing his pastoral work on a wheel, and has continued this practice ever since.—*Rev. Ferd D. Hale, Louisville, Ky.*

Had I not learned to ride an Expert some nine years ago, many sweet ministries, health in a marvelous degree, and a most joyous buoyancy of hope would have been an impossibility. Let God be praised for the Wheel!—*Rev. Luther H. Kumler, Milan, Ohio.*

Since its advent the Safety has carried me many hundreds of miles. To a pastor it is almost as necessary as the Bible, and more reliable than his salary. A sure cure for "Blue Monday."—*Rev. Owen O. Wiard, Erie, Pa.*

I expect to see the day when not to ride a wheel will be a mark of a defective education, and people will say to such a person, "Why, where have you been brought up?"—*Rev. W. J. Petrie, Chicago.*

I am soothed without the "weed;" intoxicated without the "cups," and speeded without the "whip," when I mount my wheel.—*Rev. William Denman, Grand Rapids, Mich.*

I can do more work, see more sights, give better satisfaction, and feel less exhaustion, than formerly; all because I ride a bicycle.—*Rev. William Denman, Grand Rapids, Mich.*

A good wheel, well wheeled, will wheel the rider out of dumps, blues, misty miseries, into vigor and mental sunshine; into the empire of himself.—*Rev. Wayland Hoyt, Minneapolis.*

If I were not a man, I would like to be a bird. As I am a man, I do the next best thing, and ride a bicycle.—*Rev. Maltie Babcock, Baltimore.*

The practical part in wheeling is in the pace with the pleasurable side. A vast army can bless the wheel.—*J. C. Morse, in Herald.*

Between a bicycle and post-graduate course in theology, I advise every young minister to choose the bicycle by all means.

It will help him to write better sermons and perform his pastoral duties better. And as soon as he gets married he should purchase a bicycle for his wife.—*Rev. H. W. Gleason, N. W. Congregationalist, Minneapolis.*

Only when the cycle has been become part of the daily life of its users it will have accomplished its mission, and that this period in its mission is rapidly approaching is matter for congratulation.—*Outing.*

"You wheelmen ride so fast, you always seem to be chasing something." "You're right, we're always in pursuit of pleasure."—*Wheelman's Gazette.*

I have been asked repeatedly, is it proper for ladies to ride the bicycle? Most assurdly, yes, if they will clothe themselves in loose-fitting garments which will permit freedom of the entire body, be judicious in their riding, and *procure a good wheel.—Wm. S. White, M. D. Chicago.*

Public opinion no longer foolishly holds it out of place for a lady to enjoy the exhilarating sport, and so their ranks increase. One woman after another is tempted to mount. She buys her safety, takes a few lessons quietly and then appears ready for anything from a two-mile spin to a century run. It has all been done quickly and without any fuss, hence to-day we have thousands of experienced riders among the women.—*Providence Journal.*

HOW TO SELECT A BICYCLE.

BUY a high grade wheel. As the price of a first-class wheel seems high, the question is often asked, "What is the difference between a cheap machine and a high-priced one?" Bicycles, like horses, have blood in them, and blood will tell. There is an almost indefinable something in the easy, smooth running of a strictly first-class machine.

But it does not necessarily follow that in the purchase of a high grade a buyer gets just what is best in every detail. In the discussion of this question this book shall be fearless, knowing neither fear nor favor. If mistaken in any point, it is but just that the book should suffer. If it points out weaknesses that cause any manufacturer to suffer, let him continue to suffer until he shall have made the change that will be of benefit to the purchaser.

Magnificent a machine as the safety now is, it is yet young and in more or less of an embryonic state. One may have a faulty saddle. The next may have a good saddle, but a weak axle. In another we may find imperfect form in bearings. To illustrate this point further, we sometimes find certain points in low grades superior to those in high grades. It may be superior in the matter of adjustability of handle-bars or saddle-post, or it may have a better crank fastening, and sometimes, though rarely, bearings may be superior. The cheap maker builds better

than he knows, while the high-grade maker might use a little more knowledge with profit.

The trouble is, that the manufacturer is not always in touch with the use of his wheel as he ought to be. He puts a wheel on the market and gets flattering testimonials from new purchasers whose first few days with their new wheel intoxicates them. They know nothing about the weak points that will develop later. When the trouble is seen the fellow writes a complaining letter. "My wheel rattles" is his plaint, but just why it rattles he does not explain, or if he does, the maker is liable to think him rather officious. The maker puts this letter in the waste-basket and keeps the flattering ones for other intending purchasers, and the bicycle, with its rattling proclivities, continues to be put upon a suffering public. If not too exclusive or too jealous, makers might learn good lessons from each other. For instance, we know of a bicycle whose crank shaft gives much trouble by twisting of the end, caused by a large hole in the end for a set-screw. On the same bicycle the sprocket-wheel is so fastened that it rarely comes loose. In the case of another the crank-shaft gives no trouble, but the sprocket-wheel almost invariably comes loose. If the makers of these two wheels were to consult each other, no doubt each might learn a wholesome lesson.

But since the advent of the safety the manufacturers have had much to do in looking after the rapid and fluctuating demands of the trade, and they are constantly being imposed upon by unreasonable customers. The country is full of cranks who want to trade their old machine "about even up" for the latest design. Many riders put their wheel to every unreasonable test of strength. They vault

heavily into the saddle. They run over curbstones and across ditches. They turn suddenly at high speed on wet places. They never tighten nuts, bearings, or spokes. The factories are crowded with wheels that "went down on a smooth road and ought to be repaired free to make good the guarantee."

The future tendency of the trade will undoubtedly be toward a better understanding and more harmony between maker and purchaser. A simple and strongly constructed bicycle will be furnished, and the general rider become more skilled and careful in the use of his machine.

The simplest possible form will be the future of the bicycle. The purchaser who thinks he must see many glistening parts in order to get the worth of his money, will very soon become sick of his bargain. With these general remarks let us now consider the details.

The remarks in the succeeding pages refer to the wheel in general use and not to the racing wheel. The racing wheel occupies a field of its own and has no more to do with general bicycling than the trotting sulky has to the family carriage. The racing wheel is built for a perfect track and for speed only.

FRAMES.

The concensus of opinion seems to be in favor of the diamond frame. It is the simplest and strongest form and is non-rattling. Frames with small brace-rods should be avoided. The small rods will vibrate like harp-strings and are inclined to rattle. At the end attachments rattling is almost sure to occur.

Long steering heads are strongest, give more perfect steering and cause less vibration to handle-bars.

The bracing between sprocket-wheels must be

sufficiently strong to prevent the draft of the chain from drawing them out of line.

Just back of the crank-shaft is the most vulnerable part of the frame, not, perhaps, even excepting the head. This point must bear the greatest burden of the weight of the rider in falls and slide slipping which tend to throw the wheels out of line.

The value of using two tubes in any part of the frame instead of one is questionable. They may give better lateral bracing, but with a given amount of material one tube is stronger than two.

BEARINGS.

Bearings are the vitals of a bicycle. To the invention of ball bearings is most largely due the utility of the bicycle. Their success, however, depends on best of material, good form and accurate adjustment. Good cone bearings are better than cheap ball bearings.

They should be made of tool steel and carefully tempered. The taper of the cones should be great enough for ample adjustability. Cones too flat destroy adjustability and give the displacing power of the wedge, causing them to crush balls and boxings.

Split bearings are a failure for many reasons, principal of which is the fact that they do not form a true circle.

All ball bearings should be so constructed that they may be easily taken apart for any needed repair.

Placing bearings on the outside of sprocket-wheels is most desirable because the best results are obtained by placing draft *between* points of support.

CRANK SHAFT.

The crank shaft should not be less than 11-16 of

an inch in thickness. The end on right side should have right hand threads and the end on left hand side should have left hand threads.

Should the left side have right hand threads and the check nut come loose, the cone would turn in, crushing balls and boxings.

The ends should not have holes for set screws, for these so weaken the shaft that the cranks are liable to twist the ends off.

The arrangement should be such that the cones may be removed without removing the spocket wheel. A threadless shaft is really desirable, provided the adjusting arrangement be simple and the end screw is not used for the reason named above.

A tubular shaft may be satisfactory if large enough.

CRANKS.

Cranks for men should be about 6 to 6½ inches; for ladies, a little less, provided the gear be less. The pedal is easier kept tight if holes instead of slot are used in crank. If bent outward ankles will have more room than if straight.

The tapering drive-key, with a nut to hold it where driven, is perhaps the best form of fastening to crank shaft. Is is easily tightened and easily removed. Cranks should not be too light, for in climbing hills they are inclined to bend.

AXLES.

Rear axles should not be less than ½ inch in thickness. If less than this size they will give constant trouble by bending. Threads should not be too coarse, as the deep cut will lessen strength. About twenty to the inch is the most desirable number.

The ends of forks or frame should be slotted so

wheel may be taken out without the necessity of removing axle from hub, and axle should be flattened where it fits in slot, so it will not turn when end nuts are being tightened or loosened.

SPOKES.

Spokes should be cold drawn, being largest at hub, whether direct or tangent. There should always be thread enough to admit of tightening.

It does not seem necessary that they be large if properly made.

It is not the intention of this book to enter into fine-spun theories like the relative merits of tangent or direct spokes. The number of breakages, and also of splendid wear of both, would indicate that, if honestly built, there may not be any choice.

BRAKES.

The brake spoon should be broader than the tire and must be well rounded at the rear. If the spoon be narrow and have sharp edges, it will cut the tire.

Plunger brakes, while having the advantage of simplicity, are not as perfect in results as those in which the pressure is forward of the point of attachment. A plunger brake is liable to lock the wheel suddenly, especially if there be inequalities in the tire.

Rear brakes have no particular advantage and they add much complication. The argument that brake should be applied where power is applied would require a train of cars to have brakes only on the drivers of the locomotive.

Brake joints should be close fitting and should be threaded on one side and the screw or bolt should be long enough to have a nut, this being a check nut, which prevents the screw or bolt working loose. If

the brake rod passes through a small hole in lamp bracket vibration will cause rattling.

A brake-lever will be sure to come loose if fastened directly to handle bar by a screw not passing through the bar.

The worst rattling about a bicycle usually comes from the brakes.

MUD GUARDS.

Mud guards should be far enough away from wheel to prevent clogging of mud.

They should not be fastened by screws on underside because this necessitates removal of wheel to tighten them.

If a mud guard passes between two brace rods, if close, vibration will cause rattling at this point.

ADJUSTABILITY.

In the matter of adjustability many makers have been very careless. It is no uncommon thing to find adjustability of handle bars disproportionate to that of saddle post.

The range of adjustment should be about six inches, and saddle post, handle bars, and brake rod should all be alike, so no one part will be found wanting.

Rear adjustment of chain is perhaps best, as it makes possible any alignment the wheel may need.

SADDLES.

The number of poor saddles put upon the market is something appalling. Many of the saddles now in use, if saved, will some day be placed in museums beside other instruments of torture of the days of the Inquisition.

Every saddle should be made to tilt, so that any

slant desired may be had. They should not be very wide in the center.

The spring at the rear should yield more than the one in front, so that when a jar is received the rider will sink back on the cantel where nature intended his weight should be borne.

Many inventors have labored under the impression that because riders complain of the forward jar, that a more yielding spring should be put in front. This is wrong, because where there is the most yielding spring, there the rider will sink most, and where he sinks most he will have to endure the greatest resistance.

The ends of the cantel should be lowered so as to cause a rounded appearance to the back part of the saddle. There are several saddles on the market now that would be excellent if the cantels were only dropped more.

Coils of springs should be apart, for if they rub they will squeak.

Adjustability should be great enough so that the leather may be kept well stretched.

The saddle of the future may be a pneumatic.

The requirements of a racing saddle are somewhat different and will be reviewed in the chapter, on "How to Ride."

SET NUTS.

Set nuts should not be too small, and are superior if the heads are but two-sided or not more than four.

PEDAL RUBBERS.

Hard rubbers jar the foot and cause slipping They should be a soft quality of rubber.

LADIES' WHEELS.

GEAR.

As a lady desires ease of propulsion the gear should not be high.

If the cranks be short the movement of limbs will be less pronounced.

DRESS GUARDS.

As a full skirt is necessary, dress guards must be ample, covering the entire chain and nearly the entire upper portion of the wheel. It is not enough that they cover only the forward portion of the chain; they must cover the rear sprocket wheel as well.

The guard to the chain above and below must be far enough away so that a slight slackening of the chain will not cause it to strike.

SPACE.

There must be ample space between saddle and handle bars, and no projecting bolt head should be exposed to catch the dress.

As the relative position of handles and saddle should be the same as on a gentleman's machine, there must be a greater extension of handle bars.

The position of saddle will be discussed in the chapter on "How to Ride."

TIRES.

Roads are few indeed that have a perfectly smooth surface, and the jar that comes from uneven surfaces is the thing from which riders have long prayed for deliverance. Springs repeat many times each vibration they receive, add complication and are inclined to be noisy.

It recently dawned upon the cycling world that the place to kill vibration is at contact with the ground, thus saving both machine and rider.

Cushion and pneumatic tires have presented themselves for our favor and,

"We might be happy with either,
Were t'other dear charmer away."

The cushion is a great improvement over the solid for comfort and has given most excellent satisfaction for wear, cutting less than the solid tire.

It is the thing for the general public. Quality of rubber must be good and edge of rim must not be sharp.

It is yet too early to pass judgment in this work on the details of the pneumatic tire. It is sufficient to say that it is the finest riding thing in the world, but will always, perhaps, give more or less trouble, owing to the tendency of the compressed air to break its bonds. But like love, while it usually carries with it severe penalties, we must have it if we wish to be happy.

HOW TO DRESS.

YOUR appearance and comfort will be largely determined by your manner of dressing. If dressed in bad taste, you will invite criticism, and if you have not looked after comfort, your riding will not be a pleasure.

When cycling for ladies began, a great many extravagant notions were indulged in about the manner of dressing. Ladies who were sensible dressers seemed suddenly to have lost their good taste. Flashy colors, gowns of velvet, streaming sashes, hats covered with ornamentations, caps with visors four inches long and caps with none at all, shocked the hyper-sensitive public. Add to these extravagances in dress, bad form of riding, and no wonder a certain good Bishop said that, "A woman on a bicycle looked like a witch on a broomstick."

Dress appropriately, ride gracefully, and you will soon mold public opinion in your favor. The rules for bicycle dressing are few. The skirt must contain not less than four full yards. It should have pleating at the sides, the number increasing at the back. You will notice in picture Number 3 how gracefully the skirt hangs. It is full enough so that the heels do not raise the back skirt, and the movement of the feet and limbs is not noticeable to any extent, and the saddle is almost completely hidden ftom view.

If your machine has insufficient dress guards, so

No. 3. Correct Position and Dress.

No. 4. Incorrect Position and Dress.

full a skirt will get into the wheel. You have your choice between having dress guards put on or appearing as in picture Number 4.

The skirt should be walking length, or about two inches from the ground, and equal in height all the way round. The opening should be at the side instead of at the back, then the saddle will not catch in it. The facing must be securely fastened, and the lining must be as full as the skirt.

The material must be of fair weight, broadcloth being most desirable.

The close fitting waist looks best. Blouse waists and very full sleeves are not desirable.

For the head any neat hat, not having too wide a brim, will do. A cap with a visor becomes most ladies, and is very desirable in the wind.

Gauntlet gloves look well, but are pretty warm in summer.

Wear shoes laced low down, and then over-gaiters.

The ladies' equestrian tights, heavy for cool weather and lighter weight for warm, with absence of underskirts, make the underdressing that will give you most freedom of movement and most comfort.

HOW TO LEARN TO RIDE.

YOU cannot learn to ride a bicycle by reading a book any more than you can learn to shoot pigeons by reading target theories. You must get right at it and practice. Preachers and sign-boards are invaluable as directors of the way, but if you ever reach your destination, you must do your own traveling. Greeley once said when the economists were discussing every phase of the resumption of specie payments, that the way to resume was to resume. Get a wheel and go to work, but what is better, go to a riding school if there is one in your place. While at your particular school the best form of riding may not be taught, it is by far the best opportunity that affords you. A machine will be furnished which will save you the possible breakage on your own new machine. If a man or a boy, you will first be shown how to fall off without injury to yourself or the machine. If a lady, and gracious in manner, you will be carefully held until you can go your own way rejoicing.

In this chapter will be printed the way. To reach the end successfully you must first know the way, and every move must be made with an intelligent understanding. Your natural inclination in learning to ride will be to do many things you ought not. The teacher who will succeed best with you, and who will make you the best rider in the end, is the one who will persist most in correcting your

mistakes. You will insist that "the pedals are too far away." You will turn your heels in, cutting the heels of your shoes and bending the chain guard. Nine chances out of ten, no matter how erect you walk, down will go your shoulders when you get on the bicycle. In your enthusiasm you will overwork yourself the first trial. Your teacher will have to caution you much, and when he does, give him obeyance as fast as you can.

LADIES.

While the matter of mounting at either side is arbitrary, for the reason that the left side is chosen for horseback riding, that side seems the most natural and preferable.

The instructor will take his position at left of machine, holding the handle with his left hand, leaving half the handle for the lady. The right pedal must be two-thirds the way up and forward of the center. The lady steps between the instructor and the machine, taking hold of the handle with the left hand, and placing the left foot well forward to a point even with the rear of the front wheel, and to its left, about three inches, taking care that the foot be in line with the frame of the machine. The instructor will now place his right hand at rear of saddle.

If the left foot is not placed parallel with the machine, an awkward hop will be necessary before the mount can be made. Place yourself forward of the saddle, being equal on both sides of the saddle peak. Catch the skirts just back of the knee, raising them as you raise your foot to the right pedal. Place the ball of the foot on the pedal and be certain that none of the skirts are between the foot and the pedal. Now take hold of the handle with the right

hand, pressing with both hands and both feet, raise yourself up over the saddle. There must be no hopping along on left foot, and no swerving to right or left as you rise, and then your skirts will fall equally on both sides of the machine, presenting a graceful appearance. Let the left pedal pass pretty well forward of the highest point before you place your foot upon it so your boot will not get on your dress. Do not use the brake when mounting.

BALANCING.

At first your instructor will do the guiding for you. He will move slowly so you can get the movement of the pedals. He will see that you do not get the hollow of your foot on the pedals. Gradually he will throw you on your own responsibility. You will object to this, but he must do so if your time is any value. Sit easy and do not grip the handles tightly. It is skill, not strength, that guides. Turn the wheel the direction you are falling, and if you wish to avoid an object, turn the wheel first in the direction of the object. These two propositions will seem so at variance with your scientific idea that you will not at first do as you are told. Very well, try your own way; we know you will, but be sure there is no kodak near. After you have made up your mind to do in this matter as you are advised, you will turn your wheel so far that you will have a reverse fall, and then you will say we are fooling you again. Turn your wheel only about half as far as your impulse would incline you to do.

Balancing, above all other things pertaining to cycle riding, seems most instinctive. If you think much and ride little it will be hard work learning. Keep right on practicing until it becomes a thoughtless action like walking.

MOUNTING ALONE.

If possible to get anyone to teach you, try to learn to ride before you try to mount alone. It is quite useless to try to mount only to fall over because you do not know how to balance.

The same rules as given for mounting with instructor apply, but in addition, you manage the front wheel and start the machine yourself. First turn the front wheel a little to the right, and as you rise, turn it to the left. Press hard on the right pedal, which will give your machine a good start. Do not try to catch the left pedal before you get over the saddle. Little girls with short dresses may do this, but it is not the thing for ladies.

DISMOUNTING.

You will need to give more attention to dismounting than to any other part of the work if you wish to do it well, and it is the part which you will most likely neglect, believing that to get off "somehow" is quite sufficient. A correct dismount has enough in its safety and grace to inspire you to persevere until you shall have mastered every detail in its execution. You will never dismount nicely unless you do. You must handle your brake just so; your pedals must be at the proper point; you must turn your front wheel just right—all these things, and more, or the result will be awkward and dangerous. When mastered it will be very easy.

First learn to use the brake so you can stop the machine gradually or quickly. Slow down to about the speed of walking, then do the following several things simultaneously: *When the left pedal has passed the lowest point, and is beginning to ascend, turn the front wheel to the left about a foot and then again to the right,*

making a semi-circle about a yard in length. (The lateral distance will, of course, depend on the balance; it may be more or less than a foot.) *Stiffen the left knee and rise with the pedal. Tighten the brake and press on both handles. Lift the right foot from the pedal; place it on the ground to the left of, and close to, the machine, keeping the left foot on the pedal until the right foot is on the ground. Shut the brake tight enough at the proper moment so that the left pedal will not pass the half-way point.*

The machine should be brought to a complete standstill at moment of dismount, and you should alight without noise.

You will now have noticed that we mount on a descending pedal and dismount on an ascending one. Your inclination will be to dismount while it is going down. The ascending pedal raises you from the saddle, and your weight thrown upon it helps to stop the machine, and being back at the farthest point, the space is open for the right foot. By turning the wheel to the left as you rise, the machine is kept under the center of gravity. By turning the wheel to the right the last moment, the handles are swung so as to admit of your easy exit, and also prevents the possibility of your falling to the right.

With a little practice you can so handle your right knee that it will, together with the suddenly checked momentum of the machine, carry your skirts over the point of the saddle very nicely.

In this chapter has been given only the skeleton form of instruction for mounting, balancing and dismounting. That you may not, in your efforts to become a rider, be overwhelmed with the details of graceful riding, that has been reserved for another chapter, which you are advised to study as carefully as you have the foregoing.

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No. 5. Correct Dismount.

No. 6. Incorrect Dismount.

GENTLEMEN.

Your learning does not differ materially from that of the ladies, except in the mounting and dismounting, and in dismounting it does not differ at all, except that you place your foot back over the rear wheel instead of forward of the saddle. In every other respect you must observe the same rules given to the ladies for dismounting. In learning to balance you can get excellent practice by bearing your weight on the step and handles, not using the saddle. Give the machine a good start by pushing with the foot that is on the ground. If you lose your balance you can easily save yourself and the machine by dropping the foot on the side to which you are falling.

In mounting you have a choice of several ways. The easiest and surest is to have the right pedal back of the highest point, straddle the rear wheel, placing the foot on the step, draw the machine back towards you, and then with a forward push mount the saddle, catching the right pedal as it passes over and down.

The pedal mount may be made by placing the left pedal back of the highest point about two inches. Place the foot upon it, and with a slight push forward on the handles, raise the right foot over.

Another way is to start the machine at a brisk walk, placing the foot on the ascending pedal. Vaulting into the saddle is not treating it fairly, unless you can do it lightly.

HOW TO RIDE.

GRACEFUL riding commands admiration, even from the opponents of cycling. There is such a vast difference in the appearance of two riders, where the two extremes of graceful and ungraceful riding are met, that we wonder how so many people can appear as they do.

But there is a fad abroad in the land. Many cyclers are trying to ape the scorcher. Because the scorcher adopts a low saddle and far back, bending himself into a semi-circle, is no reason why every person who rides a bicycle should do the same thing. The scorcher occupies a relation to general cycling as distinct as does the rider or driver of a horse on the race track to that of general horseback and carriage riding. The scorcher seeks for speed alone. He reduces the weight of his machine to a dangerous limit of strength if it were used for general road riding. He strips it of breaks. The wild flight of a mountain grade is of no consideration to him when compared to a pound of additional weight to his track-flier. He removes mud guards, for what would a storm of mud be to him if he won by an inch? If, by bending low, he can escape the resistance of the air, and by putting the saddle far back, take the rapid circular movement of the pedals more easily, what deference does he care to give to his military training? He wears clothes to suit his work, or if he chooses,

he wears almost none. Hatless, sleeveless, he appears on the track. Now, this is all right *in its place.*

All the people are out at the track. The riders appear. We hail them with wild enthusiasm. (They are not on their way to a drawing-room now.) They are heroes of the hour. We wish that a track was never smoother and we pray the atmosphere may hold its breath as we do ours. As they speed around the last curve for the final great effort, we hope that a new record may be made and that there may be many returns of this splendid contest.

Hundreds of riders see this, and straightway they go and push their saddles back, lower their handles, hump their backs, and the public eye is punished with the sight of would-be scorchers, proper for the racing-man, but highly improper for the average lady and gentleman cyclist.

Granting that a saddle far back admits of high speed pedaling, it is a mistake that it gives greatest power, especially for moderate speed. The greatest power is obtained by placing center of gravity over point of resistance. If the handles are not too far forward, every pound you pull is added to your weight to drive the pedals down. It shows itself most prominently in hill-climbing, where the elevation of the front wheel throws the center of gravity of the rider back of the pedals. But it is paramount for the sake of appearance. It is the only position that admits of all the elements of graceful riding. The only exception that is necessary for all ordinary riding is where the road is rough, when a slight bending of back will relieve the jar, or when a head wind is met, in which case you should get low down. On long rides no one position should be taken all the time. A change of position will rest you. There is an army of sensible business men riding the bicycle,

whose desire is to appear as such. No lady can afford to appear otherwise. A lady with improper position and dress is especially hurtful to the cause of cycling.

Here is a club of ladies and gentlemen awaiting the signal to start. The nobbiest of outfits—nickel polished, ribbons on the handle bars, uniforms in delicate shades of blue, belts with silver buckles—all for that autocrat, the Eye.

But when they mount, shades of night! deliver us from the view! They have forgotten that we have eyes. For a speed of eight miles per hour they are trying to steal from the racer the laurels he has won on many a bloody turf. They should not do it; it does not look well.

The bicycle will give you any form of movement you may choose. In its movements may be contained every element of grace—the floating of the swan, the rhythm of the waltz, or the majestic line of an eagle's flight.

A thing so full of utility, and which can be made so full of grace by proper position and dress, will not be long in commanding a place among the necessities in this age of progress.

There are many things that go to make the graceful rider. You must give each detail attention or you will fail. One incorrect move or poise of any part of the body will be noticed as eccentricity. An erect position, steady on the saddle, but when all is done, the crowning grace is that of apparent ease. They who pitch the body forward with every downward push, make the bicycle appear to be a tread mill, requiring so many horse power to move it. Rocking from side to side creates a chafing sensation—to those looking on. Saddles too low, toes in, knees out, elbows high, head low, back humped, hurts the sale of bicycles.

You may commence with the saddle a little low, but do not use it this way long enough to allow yourself to become fixed in a bad habit. Raise the saddle until high enough to cause a complete straightening out of the knee and a little dropping of the toes when the pedals are at the lowest point. Place the saddle far enough forward to get the position as in Numbers 1 and 3. The peak of the saddle should be a little forward of the crank shaft. However, as saddles vary in length, this rule is somewhat arbitrary. There should be no sensation of kicking backward. As you place the saddle forward raise it in front. Many riders fail to do this, and the result is that they have to bear heavily on the handles to keep from slipping forward. If your saddle does not admit of sufficient canting then you have bought the wrong one. This position is a little more trying on the qualities of a saddle than the far back position.

Your comfort as a rider most depends on the qualities of your saddle. You cannot give this too much attention. Before you buy you had better turn back again to a previous chapter and study the saddle question very closely. The recommendation of another, should his position differ from the one you intend to adopt, would be of little use to you. If the far back position is intended, the saddle may be lower in front and the rear spring should be the least yielding. If you adopt the erect position, the saddle must have a most yielding spring at rear. It may be well to caution you against passing final judgment on a saddle at first trial, for a new rider may feel uncomfortable or become saddle-sore by riding the best saddle ever made.

If in the case of a lady, by placing the saddle far enough forward to get the correct position, the

space becomes so crowded that she cannot conveniently mount and dismount, then she has our sympathy if she has purchased such a machine.

By straightening the knees and using the ankle movement freely, the rise of the knees may be lessened several inches. When the pedal is at the highest point, the toe should be raised and the heel lowered. Notice in Number 3, although the right pedal is at the highest point, the knee has made very little impression on the front skirt. The feet should be in line with the machine, turning neither in nor out. The knees must be kept pretty close to the machine and should not move laterally at any part of the circle. The arms should have a slight drop at the elbows. The handles should be about level with the saddle, but this will depend on relative length of arms and waist.

While dropping forward of the head or shoulders should be avoided, any leaning back is even more to be condemned.

The bicycle is capable of such high speed that there is a strong temptation to ride so fast as to cause over exertion or excessive perspiration. On the other hand some people ride too slow, causing a zigzag and uncertain movement. While exercising reasonable caution, be a fearless rider. When you come to a steep hill, if the road is clear, let it go as fast as it will. If you rid yourself of that ghost of fear, coasting is one of the greatest delights of cycling.

Yes, every hill
(It seems laconic)
Is worth a pill—
'Tis nature's tonic.

HOW TO CARE FOR THE BICYCLE.

TREAT your bicycle respectably. It was not built as a stone crusher or to even up ties on a railroad track. Jumping curbs and ditches is not conducive to bicycle longevity.

All tires, whether solid, cushion, or pneumatic, are inclined to slip when wet, hence if you wish to see what a bent pedal pin or bent crank looks like, turn suddenly on a wet place at high speed. You can get good practice at this by dodging street sprinklers while on a sprint. Should the pedal be so bent that your ankle becomes in danger of unjointing, use an axe or a sledge to straighten. Don't mind the nickel.

If it gets muddy stand the poor thing against a tree and turn the garden hose on it. Squirt it all over, including the saddle and the bearings. This will mottle the saddle with a variety of choice colors and make the balls look like Easter eggs. You may prefer this color to that of polished steel.

Remember that your enemies will injure your wheel less than your friends. When one of your friends, who never rode a bicycle in his life, makes the astounding statement that he knows he can ride "that thing," meekly inform him that it cost three times as much as his watch and that you prefer not to have it exposed to his boot heel. If his feelings seem to be hurt, and you value his friendship highly,

let him try it. If he tumbles over, bending the frame, breaking out a few spokes, and throwing the wheels out of true, insist on paying the repair bill yourself. As he did not get hurt himself, he will feel that no particular damage was done the machine.

There is another fellow you want to look out for. He sees your wheel doing nothing. He doesn't exactly know you, but some one tells him he cannot ride the thing. His pride (?) is touched and the effort must be made.

As there is no particular law for his case the best thing you can do is to watch your chance and take his horse and carriage and have a good ride.

These remarks may seem to one who has never owned a bicycle as rather severe, but you will not own one many days until their meaning will be fully appreciated. The public generally does not realize that it takes the best of material, the most costly machinery and the highest order of skill to produce the modern high grade bicycle. They look upon the bicycle as a novelty, and the price as an advantage of this fact. They have never seen the inside of a factory where thousands of dollars worth of machinery is scarcely used before it must be thrown away, to be replaced by new to satisfy the changing whims of the trade. One manufacturer informed the author that his concern invested $47,000 before they saw a bicycle come out. They were a little slow in developing the factory, and when they were ready to turn out wheels, many features of the wheel were out of date, necessitating still further expense. Years hence when the bicycle, like the locomotive, shall have a more fixed form, prices may be less.

The instructions given below are not meant to cover the details which are met in a fully equipped

repair shop. A volume could be written on repair work which would treat, for instance, of brazing and lathe work. Such knowledge would be of little use to any rider or to a small town repairer because not able to use it. In some cases the machine must go to a first-class shop or to the factory. The instructions are those within the understanding and easy application of the average rider.

Ignorance and carelessness have ruined many a bicycle. We have known of an attempt to tighten spokes by soldering them into the hub. One party rode a wheel four years and then when the spokes got loose did not know that they could be tightened by turning the nipples.

OILING.

Regular cycle oil, prepared for the purpose, is what you should use, but any medium weight oil may do in an emergency. Do not flood the bearings, but be sure that what few drops you do use get to the balls if you have to use a pin to open the hole.

When the oil holes are in the center of the hub stand the machine level for awhile so the oil will run equally both ways.

Oil the head above and below. If there is no oil-hole near the bottom, turn the machine up so the oil will run in. Many riders fail to keep the head oiled properly.

For light riding, twice a week will do, but on runs where it is dusty, better oil about every fifty miles.

In oiling a lady's wheel be sure to wipe off every particle of outside oil.

CLEANING.

If muddy do not wipe with a dry cloth, as it will

scratch the enamel. Use water, taking care to keep it out of the bearings. Dry and polish with a chamois skin. Do not put away wet, for the nickel will rust.

BEARINGS.

Keep a watchful eye on the bearings, having them neither too tight nor too loose. They are correct when, by holding the wheel at the rim, the very least lateral play can be felt. Do not crowd the bearings. If, when the wheel is raised and swung slowly, it comes to a sudden standstill, they are too tight.

The manner of adjusting bearings differs on different makes of wheels, but as a rule a check nut holds the cone. Loosen this nut and turn the cone (the one with the milled edge) to the right until it is tight and then turn it back about a quarter turn. When the check nut is tightened against the cone, the looseness will be taken up enough, owing to the space between the threads.

If a left hand thread is used on left end of crank shaft, turn to left to tighten. Never fail to set this check nut up tight.

If necessary to replace imperfect cones, or crushed balls, or to clean bearings, be sure to place a cloth underneath to catch the balls.

CHAIN.

Keep the chain just a little slack. You will find on most every machine that the chain is tighter at one point than at another. Be certain that it is a little slack at the tightest point.

Lubricate with graphite or stove-polish. Oil will gather dust and dirt, but better use it than nothing, for it is certain to cut if run dry.

If a rear adjustment, see that the wheel is left in center of fork.

BENT CRANKS AND PEDAL PINS.

If a bent pedal pin, remove it, place on a block and straighten with a hammer, or if nickeled, use a wooden mallet. Note previous caution about loosening the balls.

For a bent crank remove pedal and use a large monkey wrench, having the machine firmly held by assistants. Unless bent very badly, do not fear to do this, for they will not break. If bent very much they may have to be removed and heated.

LOOSE CRANKS.

Most cranks are fastened with a tapering drive key. Should this key get loose do not try to tighten it by turning up the nut, but place a heavy weight on the side to prevent injury to the balls, and with a hammer drive the key in with a few sharp blows, then turn up the nut.

To remove this key, after removing the nut, place a piece of copper on it to prevent injury to the thread and drive it out.

SPOKES.

For direct spokes you must have a spoke grip. Should a spoke break, raise the tire at that point and push spoke out through rim. Should the tire be hard to raise burn a piece of paper under it, if you have no rim heater. If it breaks off at the hub, use a left hand drill a little smaller than the spoke. This will nearly always turn it out and no tap need be used. Any blacksmith can make a left hand drill out of a common drill by reversing the bevel.

If a tangent spoke breaks, turn the nipple to the

left until the spoke can be pulled out and then pull out at hub, first filing off wire at crossing, taking care not to cut the other spoke. If it breaks off at the nipple, then that also must come out, in which case, the tire must be raised.

In putting in the new spoke do not be afraid to bend it. Turn the nipple down and then tie at crossing with fine wire, filling it with solder.

Most nipples have flat sides and admit the use of a wrench. Should they be round a nipple grip will be necessary.

FASTENING TIRES.

Supply yourself with tire cement. Draw the tire to one side and clean it and the rim thoroughly. Heat the cement to a liquid and also heat the rim and the tire to some extent. Place cement on every portion of the inside, then put on the tire, striking it all along with a weight. Wind a cord around tightly an inch apart and let cool which will take but a few minutes.

The heating can be done very well by burning paper under the rim.

PNEUMATIC TIRES

Are so varied in their construction that their repair cannot be considered here. Makers will furnish full instructions with each tire.

TRUING WHEELS.

Hold chalk at both sides of the rim, turn the wheel and you will mark the waves. Tighten spokes on opposite sides of chalk marks. It is sometimes best when spokes are pretty tight, to first loosen those a little on chalk sides. In the case of a direct spoke, place the grip as near the hub as you

can, and if it refuses to turn, tap it with a hammer near the rim while you press on the grip.

In case of a tangent, turn the nipple towards the hub to tighten.

If the rim has been bent badly by running into a sidewalk crack, or through any other severe strain, you cannot true with the spokes. The kinks will keep running around the wheels. You must then take it to an experienced repairer, who has facilities for such work.

Keep all nuts and bolts tight, and in tightening them, fit the wrench close and hold it firmly, so it will not slip and round the corners.

CONDUCT ON THE ROAD.

A CYCLER'S manners should be no less graceful than his movements. Good manners will pay you tenfold, and one of the first ingredients of good manners is a respect for the rights of others, even to the extent of giving deference to their prejudices. You must remember that the uninitiated cannot understand what utility and pleasure there is in cycling. The countryman who never saw a bicycle in his life may fail to turn out of the road, not because he intends to be stubborn, but because he does not realize how fast you are coming, and he is sort of transfixed anyway with the sight of the strange equilibrium of a man on two wheels. He may be scared as bad as his horses. Most country horses are very much afraid of a bicycle. It is very likely, to their puzzled brains a sort of winged devil. It is your duty in such cases to slow up, and if necessary, to dismount. It is not the thing to go dashing down a hill on a curved road with steep embankments where the view is not clear. You may meet a fractious horse driven by ladies.

If an accident happens it is better to get down by the roadside and be viewed as a ministering angel than to be regarded as a flying imp. Public opinion will rapidly mould in your favor when it learns the splendid use of cycling and that riders are generally ladies and gentlemen. Learn the

rights of the road and freely give them, but while you do this, rigidly maintain your own.

There is a species of mammalia known to cyclists by the homely but forcible name of "the road hog." Knowing that his vehicle is heavy enough to crush yours, he buries his humanity to man, if he ever had any, and deliberately rides you down. He is hoggish enough not to care for your personal rights, and ignorant enough not to believe you have any before the law. He is a very low order of being, and like the well-known Suffolk of his species, it is sometimes necessary, in order to find out which end his head is on, to punch him and make him squeal. A cycler in Minnesota last season met a doctor on a high embankment and was deliberately pushed down, wheel and all, about ten feet. Recovering himself, he remonstrated with the dispenser of pills. The doctor sprang from his carriage, and drawing a knife from his case, proceeded to carve the cyclist. That is where he made his mistake. Doctors who ride in carriages should not try to dissect the sinewy muscles of live cyclists. He lost more blood in one minute than his patients had in a month. He got a double dose of swelled head, for when he attempted prosecution his head was stuffed with some good road law.

Pugilism is not urged as a means of highway education, but maintain your rights. The League of American Wheelmen will help you. This most worthy organization has money and is pledged to maintain the rights of wheelmen.

LAW OF THE ROAD.

[Obligations are due A. B. Choate, Chief Consul, Minn., for citations of law.]

THE higher courts have decided that a bicycle is a carriage; that the rider is the driver of the carriage, and as such is entitled to the same rights and privileges as the drivers of other vehicles. State vs. Collins, 16 R. I., 371; Swift vs. City of Topeka, 43 Kansas, 671.

Chancellor Kent says of a highway: "Every thoroughfare which is used by the public, and is, in the language of the English books, 'Common to all the King's subjects,' is a highway, whether it is a carriageway, a horseway, a footway or a navigable river." 3 Kent Com., 432.

All persons have the right to travel on the highway on foot or by any means they deem fit, provided they do not unreasonably interfere with the rights of others. It must not be supposed that because the law defines a footway as a highway, and that carriages may travel on highways, that a carriage may travel on a footway, hence a bicycle (being a carriage) should not be ridden on sidewalks or footways unless special provision be made by city ordinance, and even then if damage were done, it is questionable whether the cycler would not be held responsible, though he had used reasonable precaution. A highway set apart for the use of carriages

should always be open to the use of the bicycle. Bicycles are excluded from the driveways of parks in some cities, it being argued that they frighten horses, and are, therefore, a nuisance. If carried to a higher court this unreasonable expulsion would not likely be sustained, for it can be argued that the horse is even a greater nuisance owing to his tendency to get frightened. A case in point is that where the owner of a traction engine was sued for damages for running his engine in the highway where it frightened the plaintiff's horse. Judge Cooley, of Michigan, before whose court the case came, used the following language, which is especially applicable to this phase of the bicycle question: "Persons making use of horses as a means of travel or traffic by the highways have no rights thereon superior to those who make use of the roads in other modes. It is true that locomotion upon the public roads has hitherto been chiefly by means of horses and similar animals, but persons using them have no prescriptive rights, and are entitled only to the same reasonable use of the ways which they must accord to all others. Improved methods of locomotion are perfectly admissible, if any shall be discovered, and they cannot be excluded from the existing public roads, provided their use is consistent with the present method. Bringing of an unsightly object into the common highway is not necessarily a wrong because of its tendency to frighten horses, any more than the construction of a bridge over a river is wrong, because of its tendency to delay vessels. Horses may be and often are frightened by locomotives, both in town and country, but it would be as reasonable to treat the horse as a public nuisance from his tendency to shy and be frightened by unaccustomed objects, as to

regard the locomotive as a public nuisance from its tendency to frighten the horse." Macomber vs. Nichols, 34 Mich., 212.

In July, 1889, a wheelman was arrested by the city authorities of Beatrice, Neb., upon a charge of violating an ordinance forbidding the use of bicycles in a certain street in that city. After a careful and able review of the case the defendant was discharged by the court upon the ground that the ordinance in question was unreasonable and therefore void. The court (Broady, J.), said: "It is undoubtedly the power of the city to regulate the modes of travel by carriages, or otherwise, over the streets of the city, by ordinance, . . . But there must be reasonable cause for such regulation to make it reasonable . . . There is no pretense that a bicycle occupies too much room on the street, or that the crowd of business thereon will not admit such way of going. There is no pretense that the bicycle in motion makes a noise to the annoyance of others. The sole and single objection is that horses are apt to be frightened at them. This is true of most, if not all, novel inventions for locomotion until horses have become somewhat familiar with them. I see nothing in the riding of a bicycle unusually calculated to frighten horses except its novelty, which applies to all new methods of travel in a greater or less degree, until they have become familiar . . . The invention of locomotion with the bicycle is comparatively new, especially in this country, and I am unable to say that the invention has yet reached its maximum merits, or that it may not be a thing of merit in this great age of invention, progress and improvement . . . It is said that the bicycle is a very rapid means of locomotion, and for that reason dangerous in populous places. So is a race

horse; and it is a proper ordinance to prohibit his being ridden at full speed in the streets, but improper to prohibit his being ridden through the street at a proper gait because there is speed in him. So bicycle riding, as to speed and other things, may be regulated by ordinances, but such is not the ordinance in question . . . Health and happiness are said to be great objects of human actions. Some of the evidence tends to show that bicycle riding is only for exercise and pleasure. I am not able to say that exercise and pleasure in that way may not contribute to both health and happiness. I do not, however, see that it is necessary to investigate that subject. I hold that the ordinance is unreasonable, hence void, and discharge the prisoner."

The law states that when persons meet on any road or bridge with carriages, wagons, sleighs, or other vehicles, that each shall turn to the right of the beaten track so that they may pass without interference.

A driver of a carriage or other vehicle passing a carriage or other vehicle in the same direction must pass to the left of the middle of the traveled part of the road, and if the bridge or road is of sufficient width the driver of the leading one shall not willfully obstruct the same.

There has been some dispute as to whether the middle of the laid out part of the road or the middle of the traveled part of the road is meant. The courts have differed but have generally ruled in favor of the latter. The former is certainly very ridiculous, for in case of an impassable highway where the track ran outside the fellow next to the highway would have no rights at all.

Persons on foot may use the carriage way but they have no prior rights over passing vehicles. Both must use ordinary caution to avoid collisions.

regard the locomotive as a public nuisance from its tendency to frighten the horse." Macomber vs. Nichols, 34 Mich., 212.

In July, 1889, a wheelman was arrested by the city authorities of Beatrice, Neb., upon a charge of violating an ordinance forbidding the use of bicycles in a certain street in that city. After a careful and able review of the case the defendant was discharged by the court upon the ground that the ordinance in question was unreasonable and therefore void. The court (Broady, J.), said: "It is undoubtedly the power of the city to regulate the modes of travel by carriages, or otherwise, over the streets of the city, by ordinance, . . . But there must be reasonable cause for such regulation to make it reasonable . . . There is no pretense that a bicycle occupies too much room on the street, or that the crowd of business thereon will not admit such way of going. There is no pretense that the bicycle in motion makes a noise to the annoyance of others. The sole and single objection is that horses are apt to be frightened at them. This is true of most, if not all, novel inventions for locomotion until horses have become somewhat familiar with them. I see nothing in the riding of a bicycle unusually calculated to frighten horses except its novelty, which applies to all new methods of travel in a greater or less degree, until they have become familiar . . . The invention of locomotion with the bicycle is comparatively new, especially in this country, and I am unable to say that the invention has yet reached its maximum merits, or that it may not be a thing of merit in this great age of invention, progress and improvement . . . It is said that the bicycle is a very rapid means of locomotion, and for that reason dangerous in populous places. So is a race

horse; and it is a proper ordinance to prohibit his being ridden at full speed in the streets, but improper to prohibit his being ridden through the street at a proper gait because there is speed in him. So bicycle riding, as to speed and other things, may be regulated by ordinances, but such is not the ordinance in question . . . Health and happiness are said to be great objects of human actions. Some of the evidence tends to show that bicycle riding is only for exercise and pleasure. I am not able to say that exercise and pleasure in that way may not contribute to both health and happiness. I do not, however, see that it is necessary to investigate that subject. I hold that the ordinance is unreasonable, hence void, and discharge the prisoner."

The law states that when persons meet on any road or bridge with carriages, wagons, sleighs, or other vehicles, that each shall turn to the right of the beaten track so that they may pass without interference.

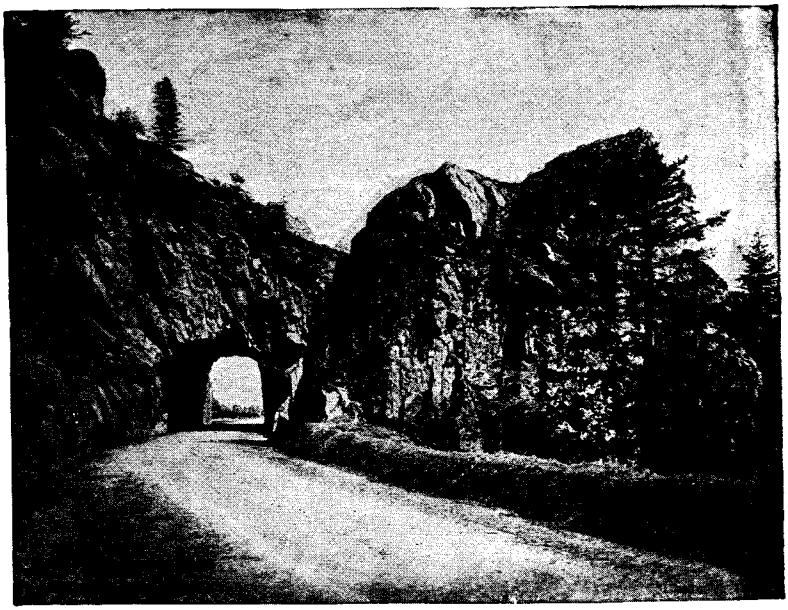
A driver of a carriage or other vehicle passing a carriage or other vehicle in the same direction must pass to the left of the middle of the traveled part of the road, and if the bridge or road is of sufficient width the driver of the leading one shall not willfully obstruct the same.

There has been some dispute as to whether the middle of the laid out part of the road or the middle of the traveled part of the road is meant. The courts have differed but have generally ruled in favor of the latter. The former is certainly very ridiculous, for in case of an impassable highway where the track ran outside the fellow next to the highway would have no rights at all.

Persons on foot may use the carriage way but they have no prior rights over passing vehicles. Both must use ordinary caution to avoid collisions.

There is no law requiring footmen or horsemen to turn to the right when passing. Therefore, the driver of a vehicle may choose the center of the road.

Courtesy demands always a display of willingness to give ample room for passing, and as passing to the right when meeting is the law, whenever the law applies, and the general custom as well, you are advised to turn to the right. Certainly, it is to be hoped that no cyclist will ever display, by his conduct on the road, any relationship to his swineship mentioned in the previous chapter.



A Country Road in France.

An American Caricature.

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ROADS.

THE cycling fraternity are the apostles of whom it is ordained to preach the gospel of good roads. There never was a concerted move to the end of bettering the roads of America until the League of of American Wheelmen took the matter in hand. It will be argued by many of our country friends that the bicycle is only a sidewalk machine anyway, and that agitation of road improvement by cyclists does not bear sufficient weight. We wish to say in reply that on many roads, for several months in the year, you and all your horses are not a success, and for the remaining months, we cyclists can go out and for a day's run beat the best horse you have.

You ought to look upon the cyclist as a good Samaritan. He is doing everything in his power to improve your roads, and unlike any other traveler who goes on wheels, he does them no injury. He ransacks the storehouses of road lore all over the world; gets his researches printed and sends it into your homes, and places it before your legislatures without cost to the people at large. He goes to sunny France and takes a picture of a beautiful road there and presents it to your view. He studies the great road engineers of England for the benefit of American highways. He even goes to take a picture of your own roads when Dante might well have written, "all who enter here leave hope behind." Give his

efforts your warmest support for he will go down in history as your great benefactor.

Roads are the arteries and veins through which flows the commerce of the land to those greatest of channels—the railroads. If these channels are defective, they check the easy passage of this world of exchange, and the vital centers of trade become clogged and torpid, and all the extremities of the land become chilled and slough off in decay.

The roads of America, are most of them, in a deplorable condition many months of the year.

The United States Commissioner of Agriculture in his report of 1888, made the following statement:

"While our railway system has become the most perfect in the world, *the common roads of the United States have been neglected and are inferior to those of any other civilized country in the world.* They are deficient in every necessary qualification that is an attribute to a good road; in direction, in slope, in shape and service, and, most of all, in want of repair. These deficiencies have resulted not only from an ignorance of the true principles of road-making, but also from the varied systems of road-building in force in the several States of the Union, due to defective legislation. *The principle upon which the several States have based much of their road legislation is known as the 'road-tax' system of personal service and commutation, which is unsound as a principle, unjust in its operations, wasteful in its practice, and unsatisfactory in its results. It is a relic of feudalism borrowed from the 'statute labor' of England, and its evil results are to-day apparent in the neglected and ill-conditioned common roads of the country.*

"It is a question of vast importance to the welfare of this nation that these arteries of agricultural and commercial life should receive the attention that their importance deserves, and that an effort should be made to remedy the defects now existing and establish a system that could be made uniform and efficient in all the States of the Union.

"By the improvement of these common roads every branch of our agricultural, commercial and manufacturing industries would be materially benefited. Every article brought to market would be diminished in price; the number of horses necessary as a motive power would be reduced, and by

these and other retrenchments millions of dollars would be annually saved to the public. The expense of repairing roads and the wear and tear of vehicles and horses would be essentially diminished, and the thousands of acres of land, the products of which are now wasted in feeding unnecessary animals, in order to carry on this character of transportation, would be devoted to the production of food for the inhabitants of the country. In fact, the public and private advantages which would result from effecting this great object in the improvement of our highways are incalculable, not only to the agricultural community as a class, but to the whole population as a nation."

The honest truth is that millions of Americans from youth to old age never saw a really good road. They do not know what a good road is. Actual tests have proven that on one of our best dirt roads it takes three horses to draw what one horse can draw on thousands of miles of roads in many countries of the old world. Little France has 130,000 miles of such road as you see in our first illustration, while America is bespattered nearly all over with the mud of such roads as we see in our second illustration. We are vain enough to say that our general intelligence is not inferior to that of the French. What is the matter? Where is the cause? The answer is easy enough. We have very rapidly settled a large country, in some cases the railroads preceding settlement. Homes are not close enough to warrant costly or even fairly decent road-making. Such is the case on the frontier.

But there are old settled communities where settlement is compact and rich, and where good road building material is easy to be obtained, and yet the roads are a disgrace to an intelligent people. The people are intelligent beyond a shadow of doubt. What is the trouble here? The answer has been partly given above. Bright as they are they do not know what a good road is. They have fallen into a

rut, not one in the road, but one which, by the way, is quite as bad, and that is one of habit. Why, we know of a road in the great State of Illinois which passes by rich and beautiful farms to a resort the most picturesque in the State. For several months in each year the clay soil is a mortar almost knee deep. There are three quarries near this road from which the best road material may be had. The owner of the resort has been to Europe and knows what a good road is and fully realizes its benefits. He offers to duplicate every dollar that the residents along this road will subscribe. The offer has stood nearly two years, and yet at this writing the clay clings like an octopus to every wheel that rolls over (or through) this road. They have fallen into a rut. A discussion of that abstract subject, the tariff, would stir them up lively, but they are not in any hurry about that road. They have carefully figured the effect tariff has on wool, for these particular people are away up in mathematics; but there are not three sheep in the neighborhood. They ought to take up a simple problem which has been so nicely demonstrated down in New Jersey. The people in Union county made up their minds to have some good roads. They put down about sixty miles of Telford road. One farm which had been vainly offered for $75 per acre, commanded $200 per acre after the roads were built. A writer who lives there made this statement: "There are fully 600 miles of Telford roads in the State of New Jersey, and I know what I am talking about when I say that the increase in land values brought about in Union county alone, would pay six times over the cost of every foot of stone road put down in the State."

A strictly first-class road always pays in return dollars for cents in increased land valuations. They

add immeasurable comfort, beautify the country and lessen the draft of every pound that passes over them.

In Southwestern Ohio there was an extensive turnpike system from which toll was taken. The owners of these pikes had no other interest than to collect their toll, became careless and let the roads run down. The counties becoming rich, purchased them, and where sale was refused, condemned the pikes. Then each county vied with all the others in having the best roads. These roads were improved and to-day that country comes as near being a paradise as any in this world.

Central Illinois, and much of Iowa, are quite as rich as that portion of Ohio was when those pikes were bought, but what kind of a comparison are we compelled to make now? About half the year in Illinois and Iowa the people are compelled to go to town on foot or on horseback.

There is perhaps no better management in the affairs of any business than in that of railroading, and it is simply astonishing to see the money that is expended in the improvement of tracks and roadbeds. These railroads seem fearfully costly; but look at the result. They will haul a ton 1,500 miles as cheaply as you can get it to the railway station. You say it is steam; but after all, the difference is in the track. A common traction engine in the fall of 1887 drew 1,000 bushels of wheat 10 miles over the splendid roads of the James river valley into Aberdeen, Dakota, and Sheridan's horses drew locomotives on the valley pikes of Virginia.

A road well built, and given a little care, will last for centuries. Some of those splendid roads of to-day in England were built by the Romans before the Dark Ages. The Appian Way from Rome to

Capua, 125 miles, was built twenty-two hundred years ago, and seven hundred years after was in good condition. Some of it is in good condition yet, and the entire length, with a little repair, could be made as good as ever.

After the storms of twenty-two centuries, the rise and fall of empires and kingdoms, the incursions of barbarians from without, treachery and sedition within, that road remains a tribute to those wise and sturdy Romans.

HOW TO MAKE ROADS.

It takes a century to correct a national wrong. This presents a forlorn hope for a national road system such as blesses France. Our country is large and the different sections vary greatly in wealth, and in some sections the material with which to make roads is scarce. It is not likely that our roads will ever reach a high standard until the general government takes them under control. In France there are 130,000 miles of splendid roads. They are under the care of a general superintendent who has sub-superintendents whose duty it is to look after and report the condition of the roads. Thus the general superintendent knows at any time the condition of all the roads in every part of France. This magnificent system is pretty far in the dim future for America. So that the richer and more enterprising sections may reap the benefit of good roads, a sort of local option seems to be the thing. Local organization is first necessary. Many a community has, perhaps, a majority of men who would gladly have a better road to town, but nothing is done because there is no organized action. In the winter months they should get together, discuss the methods of road building, and raise money for the work. Nothing

will educate the public to the value of good roads faster than an occasional stretch of macadam between seas of mud.

With your decision that you must have a better road, comes a need of more knowledge of road construction. You can pile up dirt somewhere near the center of the road. You learned this early in life "working out your road-tax" under the guidance of that master mind, the pathmaster, whose average genius for road destruction is equalled only by his ability to destroy time. The average road-maker ought to be made amenable to the law for criminal carelessness. He takes a fairly smooth road, plows it all up, scrapes it out and then scrapes the dirt back in again. He calls this "working the road," If he only left the surface regular, it might after awhile pack down and become as smooth as it was before he "worked" it; but he does not do this. He throws the dirt in irregular heaps, actually leaving hollows that hold water! Imagine the roof of a house with hollows that would hold water! A road should be uniform in its surface lengthwise, and every point from the center toward the side should be lower than all inside points. The common dirt roads of the country would be improved a hundred fold if the above hints were utilized.

But we wish to impress upon the reader that a dirt road is not good enough and that it is more expensive than the macadamized road. Macadam, after whom these roads are named, held that none of the stone or gravel should be as large as the breadth of the wheel. If smaller they would be driven down and packed tightly, but if larger, they would tend to work up. He held also that all the stone, even to the bottom of the road, should conform to this size, for if larger, they would be

displaced by the smaller sizes working into the interstices. This theory is so fully proven to be correct it is carried out in road building by all capable engineers. Macadam, however, failed in one great feature. He placed his broken stones on the ground and this does not produce the best results. The ground beneath the broken stones is not firm enough a support. A stop foundation is necessary, but stone laid flat will not do because they tend to tip up. It is found that the most perfect road foundation is that of stone set on edge breaking joints frequently, with a top dressing of macadam. This is the plan of Telford, the eminent English engineer, and are called Telford roads. The Chinese built roads of solid stone masonry, but these wore in creases and the surfaces became so smooth that horses could not travel on them. We might suppose that if macadam were placed on these Chinese roads that a fine roadway would be the result; not so, for the foundation should admit the passage of water. "The true principles of road making consists in giving a road two component parts; one—the foundation—to be solid, unyielding, porous and of large material; the other—the top surface—to be made of lighter material and to be made to bind compactly and evenly over the rough foundation."

These roads are more costly than macadam but much superior.

Macadam roads are the kind, however, that will be largely used in this country, at least for some time, owing to their less cost. The road bed should be carefully rounded first. Crushed stone or gravel of uniform size, not larger than a walnut, is what should be used. When all on, sand or very fine stone should be used to form a binding material. It should then be heavily rolled so as to form a

compact body. The road should be well settled before the dressing is put on. The dressing should be from eight to twelve inches in the center of the road. The rules of France prescribe inclinations of one in twenty to one in thirty. Roads falling more than four feet in a hundred should have a greater inclination. The greatest mistake is usually made in not getting the center high enough. The constant tendency is for the particles to work away from the center. The width of the road must be determined by the condition of the treasury. Wide roads are certainly more desirable both for use and beauty, but addition of eight and one-fourth feet makes an acre in a mile. The width of first, second and third class roadways may be given as twenty-six, eighteen and one-half and thirteen feet, with a tendency of recent years to have none over twenty-four feet, except in the vicinity of large cities.

It does not pay to make wooden bridges. Culverts should be made of stone or cement tile, oval or egg shaped.

The best road that was ever built, like everything else, must have reasonable care. The continual system of repair is the only correct policy. When a hole makes its appearance an immediate filling up will prevent a ruination that increases as the square of the time it is left. With those magnificent roads in Europe, a small pile of broken rock is placed along side the road at intervals of about 250 feet. A similar arrangement can easily be adopted in this country. While we may not feel like having road police, we can have at slight cost the services of a repairer who will go over the road at intervals and whose duties are plainly laid down, being responsible for the fulfillment of every condition.

We plead with you to wake up on this subject of

road improvement. Quit smoking around the fire for a little while these winter days and get out and stir up the neighbors to effect an organization for the work as soon as seeding is over. Make a good road while you are at it and see that it is well cared for after it is made. One of the great questions with the farmer is how to keep his sons at home until they have reached their majority. The enjoyments of the road to the farmer's son who has a horse and carriage, and is soon to be blessed with a bicycle, are his most pleasing recreations. What could be a greater inducement to a boy to stay in town over night after the theater, than a midnight return trip over the average American road in the months of March and April? In the making of permanent roads you will bless your homes and bequeath a rich inheritance to posterity.